VOLUME 1 MARCH, 1906 NUMBER 6

The Agricultural College

EXTENSION BULLETIN

"In the sunshine and the rain
I hear the robin in the lane
Singing 'cheerily,
Cheer up, cheer up,
Cheerily, cheerily, cheer up'."

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COLUMBUS

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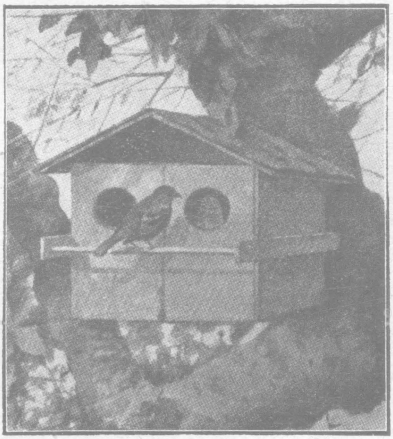
LITTLE BIRD BLUE

Little Bird Blue, come sing us your song;
The cold winter weather has lasted so long;
We're tired of skates, we're tired of sleds,
We're tired of snow banks as high as our heads;
Now, we're watching for you,
Little Bird Blue.



Soon as you sing, then the spring time will come,
The Robins will call and the honey-bees hum,
And the dear little pussies, so cunning and gay,
Will sit in the willow trees over the way;
So hurry, please do,
Little Bird Blue.

—*Selected.*

SPRING BIRDS

Who is not pleased when the songs of the spring birds are heard? How different from the stuffed and mounted bird is the real living, flitting little songster that gives us a whistle, a snappy chip, chip, or a noisy scold that announces his return to his spring haunts. From the topmost branches of the highest trees, the cardinal, or red bird, is pouring forth his whistle that invites us to look as well as listen. The little house wren scolds us away from the old brown shed and gives us and all other intruders to understand that at least one corner is his; even the English sparrow is glad to leave the place. The robin, with his sharp and quickly accented "chip, chip," announces from the old apple tree that he has come to assist with the early spring house-building. The song sparrow, or blue bird, may be found perched upon the old gate post or fence rail practicing a little song which shall soon become a part of the great bird chorus.

With all the songsters that come to remind us that nature is preparing to awaken from her winter slumber, there come the blackbird and crow, which have nothing to offer but a "chr-r-r-lck" and a "caw-caw-caw." Yet spring would not be complete without the blackbird's "chr-r-r-lck" from the tall spruce tree, the "caw" of a crow from a tree-top near, and the shrill, clear call of the lark from across the meadow or a nearby fence.

While all bird songs and calls are understood and responded to by the birds themselves, yet we cannot but feel that much of bird music is for our appreciation. Boys and girls who learn to love birds not only for their color, song, and behavior, but for their services to men, are preparing to be among the most useful men and women.

Men who have learned to know the value of birds have planted Russian mulberry trees near the strawberry patches and hung gourd houses on the ends of cross arms on poles near orchards that birds might build in them.

Boxes or bird houses do much to invite the wren, purple martin, and blue-bird to build nests near our homes. But the ever-present English sparrow soon occupies whatever is provided for other birds if not prevented from doing so. Blue-birds like to build in the hollow of a tree or snag. The best house that can be provided for these birds is a small piece of a limb hollowed out and nailed together. An

augur hole makes an excellent door. Birds that would build in houses seem to like best those that are rough and unpainted; just such roughness as nature would provide them.

The robin prefers to build his mud house in a tree near our homes, under a bridge floor, beneath a porch roof or on the third or fourth rail in the corner of a fence. Their nests are seldom found less than three feet from the ground or over twenty feet above it. We may admire the color and song of the robin, but his house-building and housekeeping may not be thought of so favorably.

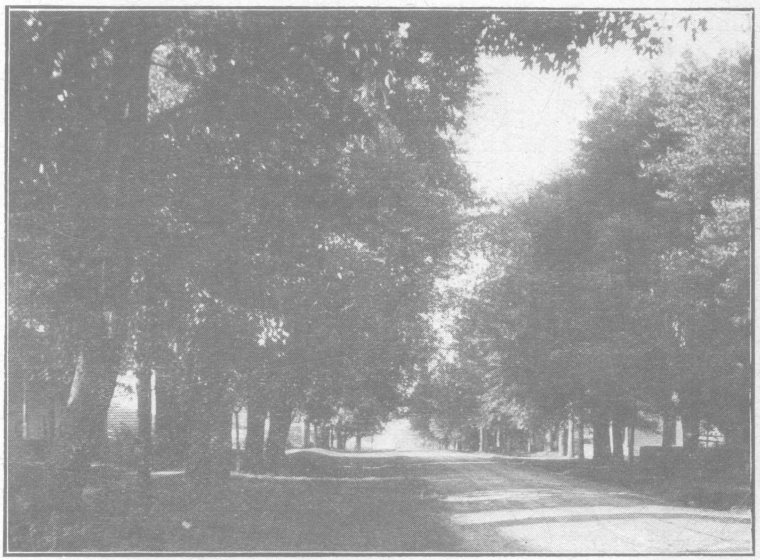
The Common Blue Bird.

While we are observing the different styles of nests our birds are building let us consider that we have learned from our geographies and other books that men have built houses differing quite as much as the nests of birds. Did you ever read about the cliff dwellers, the tree dwellers, tent dwellers, and cave dwellers? There are houses that are peculiar to a race; there are styles of architecture that are peculiar to certain people of a race. It is noticeable that the houses

of man, although they retain certain general features, are made to suit his individual notions as to color, convenience, location, size, etc., but in nest building the oriole is as determined to-day as ever to select gay colored threads or strings with which to build a nest that shall swing from the small branches of a tree. The chipping sparrow seems to think that it must have a lining of hair for its nest. The song sparrow is quite satisfied with fine grass.

The spring visitors, the crow and blackbird included, are well worth inviting to our dooryards, orchards, and fields to prevent the rapid increase of insect pests. Even those we think are least entitled to our protection more than pay for what real damage they do.

Let us build a bird house, feed the cats, put away air guns and rubber flippers and make the birds our friends.



The people of this little village believe in green lawns, shade trees, and birds.

TESTING SOILS FOR APPLICATION OF COMMERCIAL FERTILIZERS

H. A. WEBER, PROFESSOR OF AGRICULTURAL CHEMISTRY.

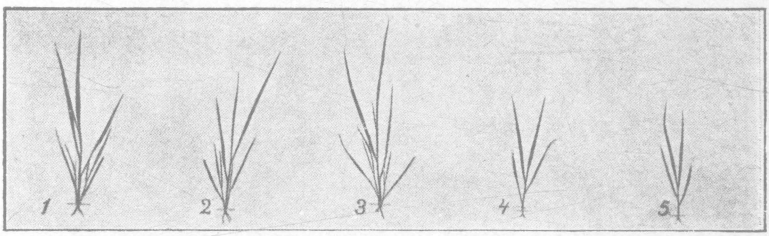
During more than twelve years of active service in connection with farmers' institutes, the writer has endeavored to impress upon the farmers the necessity of a more rational method in the use of commercial fertilizers, in order to avoid useless expenditure of money for

plant food which their soil did not require. The means for reaching this result were fully explained, but with few exceptions farmers could not be induced to make for themselves the ordinary field experiments which would inform them of the needs of their soil and indicate what fertilizers to buy for their fields.

In 1885, the writer instituted a series of experiments with soil in sewer pipes for the purpose of securing a method by which these soil tests could be made for the farmers at the Ohio State University.

The sewer pipes employed were fifteen inches in diameter and the amount of soil required was about 600 pounds. Subsequently it was found that by the use of six-inch tile, the amount of soil required could be reduced to seventy-five pounds with equally satisfactory results. The soils were collected in accordance with the following directions.

1. Never take a sample of soil from a field which without fertilizers is capable of yielding a full crop. On a soil of this nature commercial fertilizers will not pay.



Relative size of oat plants on June 23.

2. Never take a sample from a field which is not in a high state of cultivation, that is, which is not well drained, and where the soil when cultivated is not deep and not well pulverized. Commercial fertilizers cannot counteract bad physical conditions of the soil.

3. Never take a sample from a meadow or clover sod, but always from fields under cultivation.

4. If a field is in a high state of cultivation and still fails to produce more than half a crop, there is good reason to believe that the soil is deficient in one or more of the essential ingredients of plant food. From such a field, an average sample of soil should be taken for testing. In order to collect an average sample, proceed as follows:

Begin at one end of the field and cross it back and forth at intervals of eight or ten paces until the other end is reached. While thus crossing dig a square hole with a spade every eight or ten paces down to the subsoil. Cut off a slice about two inches thick from the surface

down to the subsoil and throw it into a wagon bed. Better still cut out a core of soil with a post-hole digger at each point. Avoid all places covered with manure, piles of decaying vegetable matter, etc. Remove any trash from the surface by scraping before digging the hole or sinking the post-hole digger. Also avoid all low places in the field, especially if they are filled with black soil of leaf mold. Thoroughly mix the soil thus collected and take not less than seventy-five pounds for testing. The test is made in the following manner:

Ordinary six-inch tile are placed in a large wooden box 4 feet long, 1 foot wide and 16 inches high, which contains enough clean sand so that the top of the tiles will be on a level with the top of the box. The whole is then filled with sand with the exception of the upper seven inches of the tiles. The sand is then thoroughly drenched with rain water. The empty portion of the tiles are next filled to within an inch of the top with the thoroughly mixed sample of soil; the fertilizer is added and incorporated with the upper portion of the soil

Relative size of plants on July 5.

by stirring, moistened if necessary; fifteen seeds of oats are distributed uniformly over the surface and then covered with enough of the dry soil to bring the surface of the soil on a level with the top of the tiles. The six-inch tiles to the depth of seven inches as described will contain about ten pounds of soil.

Five miniature plots are thus prepared for each soil test. The sand surrounding the tiles is kept moist by adding water once a week. The box should have a few holes in the bottom for drainage.

The amount and kind of fertilizer to be added to the five plots for each test are as follows:

PLOT 1—COMPLETE FERTILIZER.

Superphosphate	1 teaspoonful
Potassium sulphate	½ "
Sodium nitrate	½ "

PLOT 2—COMPLETE MINERAL FERTILIZER.

Superphosphate	1	teaspoonful
Potassium sulphate	½	"

PLOT 3.

Superphosphate	1	teaspoonful
Sodium nitrate	½	"

PLOT 4.

Potassium sulphate	½	teaspoonful
Sodium nitrate	½	"

PLOT 5.

No fertilizer.

Relative size of crops.

NOTE—These fertilizers can be secured free by applying to the Superintendent of the Department of Agricultural Extension of the College of Agriculture.

The soil in question was arranged in five plots as described. The following notes will give a clear idea of the effects of the fertilizers:

May 31. Fifteen oat seeds planted in each plot.

June 3. All plants were up.

June 10. No difference in appearance of plants.

June 17. Plants of plots 1, 2, and 3 were alike and in advance of those of plots 4 and 5, which were also alike.

June 19. Plants of plots 1, 2, and 3 had one side shoot on each plant. Those of plots 4 and 5 had none.

June 21. Plants of plots 1, 2, and 3 had two vigorous side shoots. Those of plots 4 and 5 had none.

June 23. Same conditions, with plants of plots 1, 2, and 3 far in advance of those of plots 4 and 5. At this date, one plant of each plot was removed, mounted, and kept for comparison.

(Figure 1 shows the relative size of the plants at this date.)

Young Experimenters
Boys' Agricultural Club, Washington Twp., Franklin Co.

July 5. Plants of plots 1, 2, and 3 far in advance of those of plots 4 and 5. No productions of side shoots in plots 4 and 5. Plants of plot 2 showed signs of nitrogen starvation. An average plant of each plot was removed and mounted as above.

(Figure 2 shows relative size of plants at this date.)

July 10. Plots 2 and 5 showed nitrogen starvation in marked degree. The others did not. Plot 4, however, was not farther advanced in growth than plot 5. Side shoots of plot 2 not so vigorous as those of plots 1 and 3.

July 14. Nitrogen starvation of plots 2 and 5 very marked.

July 18. All plots beginning to head.

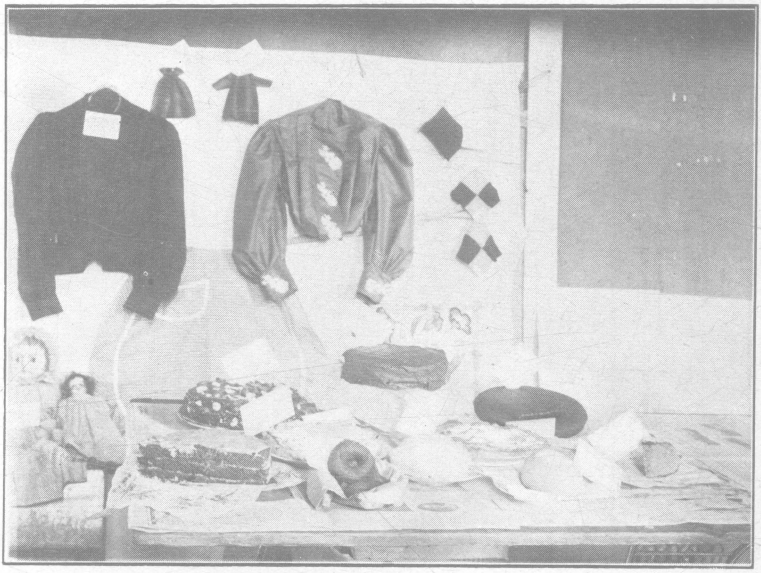
July 21. Side shoots of plot 2 had practically vanished. Growth of plants less vigorous than those of plots 1 and 3.

Aug. 9. Plants were harvested and allowed to dry. Plots 1 and 3 had tallest and strongest plants with best heads.

After becoming air-dry the whole crop of each plot was weighed with the following results:

Plot.	Weight Grams.
1	22.0
2	17.5
3	22.5
4	9.0
5	9.0

(Figure 3 shows relative size of crops.)



An exhibition made by the Girls' Domestic Art Club of Washington Twp., Franklin Co.

From this it is readily seen that the soil in question was chiefly deficient in available phosphoric acid. It was also deficient in available nitrogen, but in a less degree. The owner of the land from which the soil was taken was advised to employ kinds and amounts of fertilizers:

Superphosphates for all crops.

Fine bone meal	300	pounds per acre
Sodium nitrate	100	" " "

FOODS IN PLANTS

Let us ask the plant, in a few simple experiments, what foods it has secured for us from the air and the soil.

EXPERIMENT No. 1.

With a pen-knife scrape enough from a potato, sweet potato, turnip, or parsnip, to cover a good sized blade. Or take enough fine corn meal, oat meal, or flour to cover a knife blade. Put the scraping, meal or flour, into a well cleaned small bottle and add enough hot water to make a thin paste. Drop one or two drops of the tincture of iodine into this paste, and it is noticed that it immediately turns blue. This experiment tells us that plants contain starch.

EXPERIMENT No. 2.

Chew a piece of sorghum cane, beet root, apple, cabbage, turnip, or common cracker. Don't chew just for a moment and swallow; then continue chewing until you cannot resist swallowing. The starch has been converted into sugar by the saliva and it now tastes sweet.

EXPERIMENT No. 3.

On a piece of good white paper mash a peanut, hickory nut, caster oil bean, the germ of a corn grain. If they make grease spots, they contain fat and oil.

EXPERIMENT No. 4.

Chew a number of grains of wheat and a gummy substance is obtained. Children usually call it home-made chewing gum. Put some flour in a muslin bag and wash it thoroughly by rubbing in a pan of water. There will remain a sticky substance in the bag and a white sediment in the pan. What is in the bag is an albumenoid food which resembles the white of an egg. Pour off the water in the pan and test what remains (Experiment No. 1) to determine what it is.

EXPERIMENT No. 5.

Grate or crush some cabbage leaves or potatoes in clean water. Separate the solid part from the liquid by straining through muslin. Carefully heat the strained liquid and a substance in flakes will settle. This substance is an albumenoid.

EXPERIMENT No. 6.

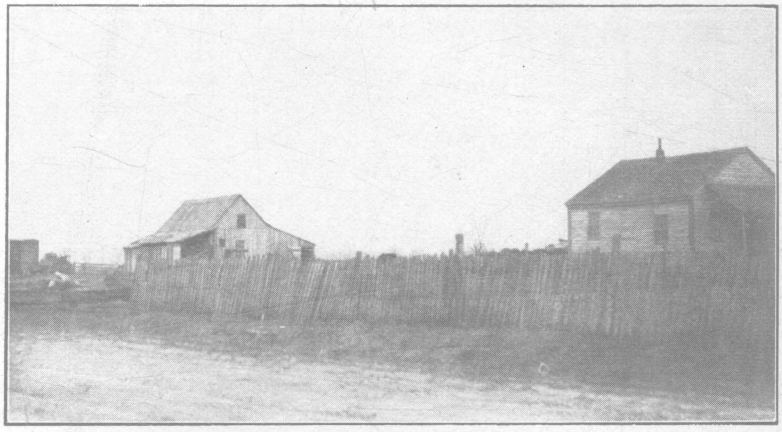
Mash a turnip or apple into a fine pulp. It will be observed that there is much free water. If the pulp is placed in an oven and thoroughly dried it will be found upon carefully weighing what remains that a large per cent of water has escaped. Plants are from 65 to 95 per cent water. If what remains is burned a small per cent of ash will still remain. The ash came into the plant from the soil; the foods spoken of have been manufactured in the plant from what it has received largely through the leaves from the air.

In the January bulletin directions were given for finding practically the same foods in milk.

SOIL MAKING

KINDS OF SOIL.

What is the difference between sand and gravel?
What is the shape of a grain of sand? of a pebble?
What is dust? dirt? What are boulders?
What is the difference between dust and mud?
What colors have you seen in clay?
Where do we generally find clay?
What becomes of the plants that die? What is leaf-mould?
Why do farmers often plough grasses into the soil?
What is the color of the richest earth you have seen?
Which allows water to pass through it more readily, sand, or loam?
Do plants every grow upon bare rocks?
In what ways do farmers make the soil richer?
How deep is the loam in your garden?
What is under the loam? under that?



100 Degrees always means that in the sun here.

DISTRIBUTION OF SOIL.

What makes water muddy?
Which will a brook carry farther, fine sand or pebbles?
Which can carry a greater quantity of silt, a rapid or slow river?
Which can carry the coarser and heavier?
How far can a stream carry silt?
What is in the beds of sluggish brooks? rapid ones?
Why do river banks somtimes cave in?
Where do pebbles along the beach come from?
Why are they smooth and rounded?
From what is sand made? How?
What makes rocks crumble?

What cracks large rocks?

Why are coast lines irregular?

How do jetties deepen a river? (Make one in the brook.)

What becomes of the material washed out?

In what order does running water deposit its different kinds of sediment?

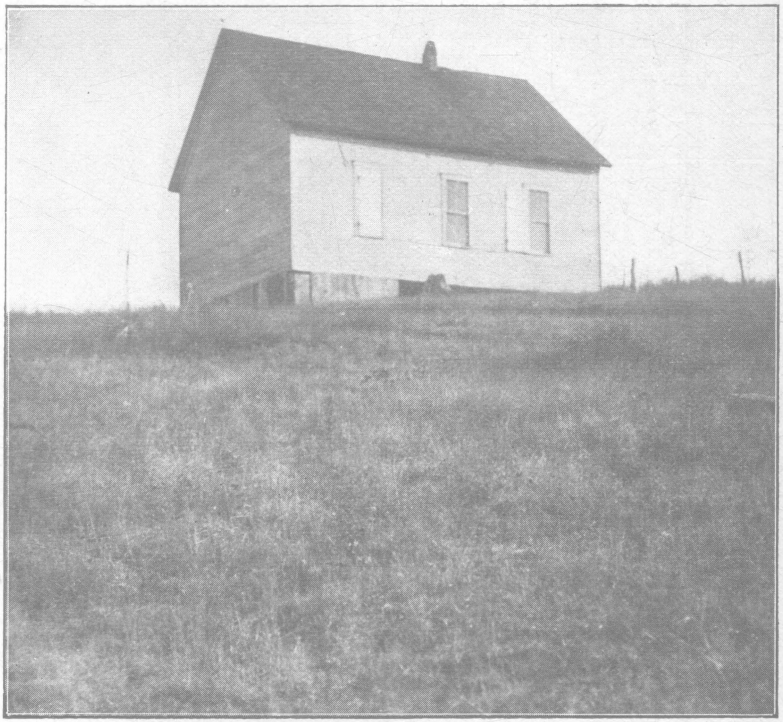
In what part of a brook basin do we find the finest and richest soil?

Why are bottom lands so fertile?

If a muddy brook empties into a pond, where will the sediment be deposited?

How are deltas formed?

Of what is the soil in a delta composed?



A Country School House.
Sunshine above and weeds below.

AGENTS AT WORK IN THE SOIL.

Why do farmers plough before they sow?

What is the action of the frost in the soil?

How deep does the ground freeze?

How does nature loosen the soil each year?

How far into the ground do roots penetrate?

Why do we loosen the soil about roots?

When it rains, does the fine or coarse soil settle below the surface? What brings it back?

Where do the worms come from during a rain-storm?

Where do they live? What do they feed upon?

What do they constantly bring to the surface?

Do you know of any insects or bugs that improve the soil?

Of what use are little ant-hills all over a field?

How do bugs and worms get air underground?

As we dig below the surface, does the ground appear to become warmer or colder in summer? winter?

Of what use is the sun's heat in the soil?

Of what use is the rain to the soil? snow?

Frye's Child and Nature.

Maple trees planted in 1885 on a schoolground in Miami county.

Summer Term at the Ohio State University

The Summer Term of the University opens Monday, June 25, and continues for six weeks. The beautiful campus, the great number of large buildings, the splendid equipment, and the excellent arrangement of courses lend an inspiration to the student's work which makes the summers at the University seasons of pleasure as well as profit. Very definite and thorough work is done in the class-room. It is the aim of the school to send its students away with a broader outlook upon life, with a more thorough preparation for the problems which await them, and with a greater love for their work.

In addition to the courses which were established last year, several new ones are offered this year. It is especially worthy of note that

two courses are offered in Agriculture, two in Domestic Science, and that three new courses in Education have been added. Many teachers have been anxious to do something in agricultural work in their schools. The courses that are offered this year will furnish them an opportunity to equip themselves for this work. They can learn what things are of most worth in an agricultural course, how to present the material to children, how much time should be given to the subject, how it correlates with geography and other studies, and what the practical value of it is to the children and to the community. Domestic Science will appeal to a large class of young women who are

Maple trees in 1905 on the same schoolground. Twenty years of growth.

in the advancing rank of those teachers who want to be prepared to carry forward the newest and best things in education.

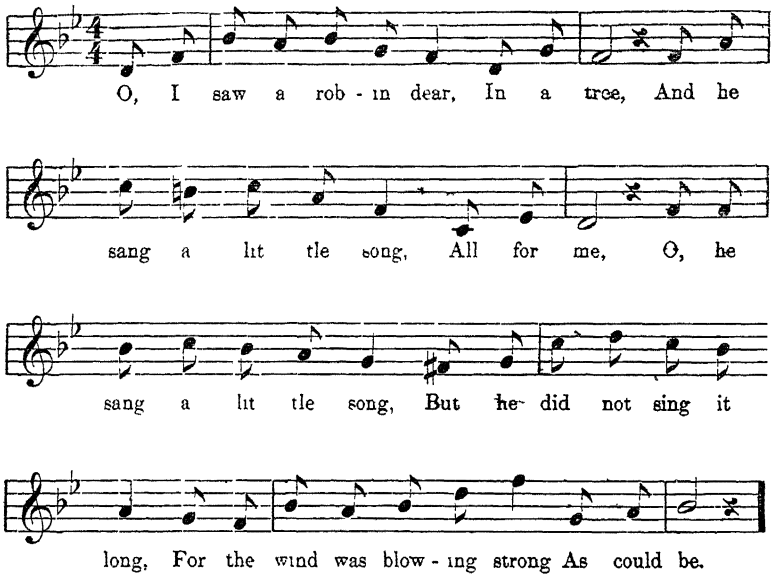
The classes in School Administration and Secondary Education will be acquainted with the best ideas and practical suggestions of the leading educators of our country on matters pertaining to administration and high-school work.

The expense of attending a Summer Term in Columbus is light. Very comfortable rooms with board can be had for $4.00 per week, and the tuition for the term is only $6.00.

If you are wanting to prepare for college, if you want to do college work for credit toward a degree, if you are a teacher, send for a bulletin by addressing the Secretary of the Summer Term, Mr. W. W. Boyd, Ohio State University, Columbus, Ohio.

THE FIRST ROBIN.

LIZZIE BURT A J G



2 And it blew him far away, Out of sight,
And the snow was falling down, Thick and white,
Oh! it blew him far away! And I did not care to play,
Any more at all that day, Until night.

3 When at night I said my prayer By my bed,
I remembered what in church Once was said,
How God listens to each word, So I told Him of the bird,
And I'm very sure he heard What I said.

4 For the snow soon went away, And at dawn
Little robin hopped about On the lawn,
And he sang a jubilee In the crooked appletree,
For the winter, don't you see? It was gone.—

Selected from Model Music Course Primer
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